

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Patent Application of:

Inventor(s) : Pedlow, Jr., et al.
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Title : Bi-Directional Indices for Trick Mode Video-On-Demand

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Date 11/16/2009

SUBSTITUTE CORRECTED APPEAL BRIEF

This substitute appeal brief is submitted in response to the Final Office Action dated 6/22/2009 and subsequent Advisory Action dated 9/3/2009, and further responsive to the Notice of Non-Compliant Appeal Brief dated 11/12/2009. Reconsideration and allowance of all claims at issue are respectfully requested.

The fee for this brief was previously paid. The Commissioner is authorized to deduct any underpayment or credit any overpayment to deposit account number 501257.

REAL PARTY IN INTEREST

The real party in interest in this appeal is the assignee(s) of this application - Sony Corporation and Sony Electronics, Inc.

RELATED APPEALS AND INTERFERENCES

None known to the undersigned.

STATUS OF CLAIMS

Claims 1-19 stand rejected based 35 U.S.C. 103(a) in view of the combination of U.S. Patents no. 6,327,421 to Tiwari et al. (hereinafter Tiwari) and 6,445,738 to Zdepski et al. (hereinafter Zdepski).

Claims 19-27 and 44 stand rejected based 35 U.S.C. 103(a) in view of the combination of U.S. Patent No. 6,453,115 to Boyle (hereinafter Boyle), Tiwari and U.S. Patent no. 6,057,832 to Lev et al. (hereinafter Lev).

Claims 28-43 have been cancelled without prejudice. Claims 1-27 and 44 are being appealed.

STATUS OF AMENDMENTS FILED SUBSEQUENT TO FINAL REJECTION

Not Applicable.

SUMMARY OF CLAIMED SUBJECT MATTER

The following summary is supplied in compliance with the requirements of the appeal rules. The undersigned wishes to note that this summary is provided merely as an aid to the Board in rapidly understanding the invention and the issues relating to this appeal and do not supersede what the claims actually state (69 Fed. Reg. 155 (Ayg. 2004)). As such, this summary should not be construed to limit the invention in any way.

In claim 1: A method of storing digital video content to facilitate trick play (page 11, lines 19-29), the content comprising intra-coded frames of video and inter-coded frames of video (page 8, lines 4-8), the method comprising:

- storing the inter-coded and the intra-coded frames of the content in a first file (200, Fig. 3);
- storing a duplicate of the intra-coded frames of the content in a second file (220, Fig. 3);
- storing a set of forward indices (222, Fig. 3, Table 1) that relates the intra coded frames with the inter-coded frames in a forward direction such that playback of the second file in the order of the forward indices simulates a fast-forward playback; and
- storing a set of reverse indices (224, Fig. 3, Table 2) that relates the intra-coded frames with the inter-coded frames in a reverse direction such that playback of the second file in the order of the reverse indices simulates a fast-reverse playback. (Page 12, line 1 – page 13, line 13, Figs. 3, 3A and 4 generally)

In claim 10: A method of storing digital video content to facilitate trick play (page 11, lines 19-29), the content comprising intra-coded frames of video and inter-coded frames of video (page 8, lines 4-8), the method comprising:

- storing the inter-coded and the intra-coded frames of the content in a first file (200, Fig. 3);
- storing the intra-coded frames of the content in a second file file (220, Fig. 3);
- storing a set of indices that relate the intra-coded frames in the first file with the intra-coded frames in the second file, such that playback of the second file simulates a fast-forward playback if played back in a first order and simulates a fast rewind if played back in a second order (Table 3, page 14, lines 14-23).

In Claim 19: A method of storing digital video content to facilitate trick play (page 11, lines 19-29), the content comprising intra-coded frames of video and inter-coded frames of video (page 8, lines 4-8), the method comprising:
at a video on demand system for a television service provider (Fig. 3 generally):

storing the inter-coded frames of the content in a first file (300, Fig. 5);

storing the intra-coded frames of the content in a second file (320, Fig. 5);

storing a set of forward indices that relate the intra-coded frames to the inter-coded frames in a forward direction such that playback of the second file in the order of the forward indices simulates a fast-forward playback (Fig. 5, 322);

storing a set of reverse indices that relate the intra-coded frames to the inter-coded frames in a reverse direction such that playback of the second file in the order of the reverse indices simulates a fast-reverse playback (Fig. 5, 324), and

where, commands received at the television service provider from a subscriber terminal requesting trick play modes are implemented by retrieving inter-coded frames from the first file using either the forward or the reverse indices (page 16, line 21 – page 18, line 2, Fig. 5 generally, Fig. 6, 368, 372, 380, 376).

In Claim 44: A computer readable storage device for storage and retrieval of digital video content, comprising:

at least one computer readable storage medium for use in conjunction with at a video on demand system for a television service provider (70, 300 320, Fig. 5);

a first file residing on the storage medium storing inter-coded frames of the digital video content (300, Fig. 5);

a second file residing on the storage medium storing intra-coded frames of the digital video content in a second file (320, Fig. 5);

a forward index table residing on the storage medium that relates the intra-coded frames to the inter-coded frames in a forward direction such that playback of the second file in the order of the forward indices simulates a fast-forward playback (322, Fig. 5);

a reverse index table residing on the storage medium that relates the intra-coded frames to the inter-coded frames in a reverse direction such that playback of the second file in the order of the reverse indices simulates a fast-reverse playback (324, Fig. 5), and

where, commands received at the television service provider from a subscriber terminal requesting trick play modes are implemented by retrieving inter-coded frames from the first file

using either the forward or the reverse indices (page 16, line 21 – page 18, line 2, Fig. 5 generally, Fig. 6, 368, 372, 380, 376).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The rejection to claims 1-19 based 35 U.S.C. 103(a) in view of the combination of Tiwari and Zdepski.

The rejection to claims 19-27 and 44 based 35 U.S.C. 103(a) in view of the combination of Boyle, Tiwari and Lev.

GROUPING OF CLAIMS

Group 1 – claims 1-9.

Group 2 – claims 10-18

Group 3 – claims 19-27.

Group 4 – claim 44.

ARGUMENTS

Regarding Group 1, claims 1-9:

The Examiner has rejected claims 1-9 based on the combination of Zdepski and Tiwari.

The Examiner has erred in the rejection of claims 1-9 based on the combination of Zdepski and Tiwari and has failed to establish *prima facie* obviousness. The references cannot be properly combined because they clearly teach against each other. The MPEP at 2145 X D2 citing *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983) explicitly states that “References Cannot Be Combined Where Reference Teaches Away from Their Combination” and “It is improper to combine references where the references teach away from their combination.”

It is noted that the Office admits that as a matter of fact Zdepski teaches away from index lookups” (page 2, second paragraph of Final Office Action). The MPEP and controlling case law therefor explicitly forbids the combination, and the Examiner has erred in making the combination.

The Examiner has further erred and failed to establish *prima facie* obviousness by making a combination wherein the proposed combination renders the prior art unsatisfactory for its intended purpose. Appellants note that MPEP 2143.01 V, citing *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) states that “The proposed modification cannot render the prior art unsatisfactory for its intended purpose” and “[i]f proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.” Further, MPEP 2143.01 VI, citing *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959) states that “[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.”

Not only should the above teaching away preclude the Examiner’s use of the combination, but in addition, Appellants further submit that the Tiwari reference teaches against use of the types of trick play files claimed and the type used by Zdepski. Tiwari teaches that use of trick play files containing only I frames selected from the main content file causes “jerky picture quality because of the uneven spacing of the I-picture spacing” (col. 1, lines 43-46). This in fact precisely the problem Tiwari seeks to solve. He solves this problem by selecting every *n*th picture and converting those pictures (if B or P pictures) to an I picture. This collection of I pictures is then used for a smooth trick play mechanism since every *n*th picture is selected rather than a sequence of I frames from the content (which are not uniformly spaced).

In the Advisory Action, the Examiner erroneously asserts without any technical support that “it is reasonable to expect that the *n*th frame may be an I frame”, but the claims call for “storing the inter-coded and the intra-coded frames of the content in a first file; storing a duplicate of the intra-coded frames of the content in a second file” (emphasis added), thus the file structure defined is not consistent with Tiwari. Moreover, one cannot overlook the fact that the Examiner’s interpretation is directly contrary to Tiwari’s teachings regarding the problem he seeks to solve, would render Tiwari unsatisfactory for its intended purpose by failing to solve the problem addressed by Tiwari and would dramatically change the principle of operation of the reference – and in doing so, destroy the intended function of Tiwari. Hence, use of Tiwari in

conjunction with a trick play file made of I frames from the content would not only fly in the face of Tiwari's teachings of the disadvantages of such I-frame trick play files, but would in fact destroy Tiwari's main function as well as alter the method of operation in a destructive manner. Ergo, the proposed modification is further improper as discussed above and *prima facie* obviousness has not been established.

As a result, not only does Zdepski teach against use of Tiwari's indices, Tiwari teaches against Appellants' file arrangement and Zdepski's trick play files. Moreover, use of Zdepski's trick play files or Appellants' claimed file arrangement in Tiwari would destroy the intended function of Tiwari. Hence, all possible permutations of proposed combination of teachings are wholly improper to form a viable case of *prima facie* obviousness. (It is noted that the Examiner has used these references in two different rejections by merely changing their order, but it is submitted that the order is irrelevant. If the references are improperly combined, the combination is improper in any order.)

Reversal of the rejection and allowance of claims 1-9 are respectfully requested at an early date.

Regarding Group 2, claims 10-18:

The Examiner has also rejected claims 10-18 based on the combination of Zdepski and Tiwari.

The Examiner has erred and failed to establish *prima facie* obviousness for the same reasons as those discussed with regard to Group 1. Reversal of the rejection and allowance of claims 10-18 are respectfully requested at an early date.

Regarding Group 3, claims 19-27:

Claims 19-27 were rejected as obvious based on the combination of Boyle, Tiwari and Lev. The Examiner has erred and failed to establish *prima facie* obviousness in this rejection also.

The Examiner admits at page 14, first paragraph that Boyle and Tiwari do not explicitly teach "storing the inter-coded frames of the content in a first file and storing the intra-coded

frames of the content in a second file and where, commands received at the television service provider from a subscriber terminal requesting trick play modes are implemented by retrieving inter-coded frames from the first file using either the forward or the reverse indices". The Examiner looks to the Lev reference to supply these teachings. The Examiner then proceeds to explain how he believes the Lev reference to supply these teachings. However, one must analyze the claim language to recognize that the claims call for "storing the inter-coded frames of the content in a first file" and that the last sub-paragraph of the claim calls for retrieving the inter-coded frames from the first file using either the forward or reverse indices (emphasis added).

The Board's attention is again drawn to the fact that the claim calls for use of the inter-coded frames of the content to be directly used to create trick play. However, Tiwari explicitly wishes to avoid the use of the content's inter-coded frames directly so as to not produce jerky trick play and therefore creates another set of pictures for trick play. Hence, again the proposed combination destroys the intended function of the Tiwari reference. Per MPEP 2143.01, this is improper and *prima facie* obviousness has not been established. In view of this error, claims 19-27 and 44 are improperly rejected. Reversal and allowance are respectfully requested at an early date.

It is further noted that claim 19 is apparently also rejected based upon the combination of Tiwari and Zedepski. In this regard, the arguments regarding claim Group 1 are equally applicable and the rejection is improper. Reversal and allowance are respectfully requested at an early date.

Regarding Group 4, claim 44.

This claim is rejected as obvious based on the combination of Boyle, Tiwari and Lev. The Examiner has erred in this rejection also and failed to establish *prima facie* obviousness. The rejection is submitted to be in error for at least the same reason as that explained for Group 2.

Additionally, the Examiner has erred and failed to establish *prima facie* obviousness in stating that “Performing said method of claim 19 would imply and necessitate a storage device of claim 44” (in explaining that the same rejection is applied as that of claim 19, page 20 first full paragraph of the rejection). It is respectfully submitted that there are multiple additional differences between claims 44 and claim 19, yet the Examiner has failed to articulate his reasoning for rejection of claim 44 by rigid application of the factors from *Graham v. John Deere*, 383 U. S. 1 (Supreme Court, 1966) including identification of each and every claim feature in the cited art. Reversal and allowance are respectfully requested at an early date.

In conclusion, the Examiner has erred by improperly combining references in a manner that operates to destroy the function and objectives sought to be addressed in the references, and he has improperly combined references that teach against one another, where such modification and combination substantially changes the mode of operation of the references modified. These errors result in a failure in multiple Office Actions to establish *prima facie* obviousness. The claims are believed patentable and reversal by the Board is respectfully requested.

Respectfully submitted,

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CLAIMS APPENDIX

1. (Previously Presented) A method of storing digital video content to facilitate trick play, the content comprising intra-coded frames of video and inter-coded frames of video, the method comprising:

storing the inter-coded and the intra-coded frames of the content in a first file;

storing a duplicate of the intra-coded frames of the content in a second file;

storing a set of forward indices that relates the intra coded frames with the inter-coded frames in a forward direction such that playback of the second file in the order of the forward indices simulates a fast-forward playback; and

storing a set of reverse indices that relates the intra-coded frames with the inter-coded frames in a reverse direction such that playback of the second file in the order of the reverse indices simulates a fast-reverse playback.

2. (Original) The method according to claim 1, further comprising generating the set of forward indices and the set of reverse indices for storage.

3. (Previously Presented) The method according to claim 1, wherein the digital video content is MPEG encoded, wherein the intra-coded frames comprise I-frames, and wherein the inter-coded frames comprise P-frames and B-frames.

4. (Original) The method according to claim 1, further comprising retrieving the inter-coded and the intra-coded frames from the first file to produce a normal playback stream.

5. (Previously Presented) The method according to claim 4, further comprising retrieving the intra-coded frames from the second file in the order of the forward indices to produce a fast forward playback stream, and wherein the retrieving of intra-coded frames from the second file starts at a frame near a current playback point in the normal playback stream, and wherein the frame near the current playback point is determined from the forward indices.

6. (Previously Presented) The method according to claim 1, further comprising retrieving the intra-coded frames from the second file in the order of the forward indices to produce a fast forward playback stream.

7. (Original) The method according to claim 6, further comprising retrieving the inter-coded and intra-coded frames from the first file in the order of the forward indices to produce a normal playback stream, and wherein the retrieving of inter-coded and intra-coded frames from the first file starts at a frame near a current playback point in the fast forward playback stream, and wherein the frame near the current playback point is determined from the forward indices.

8. (Previously Presented) The method according to claim 1, further comprising retrieving the intra-coded frames from the second file in the order of the reverse indices to produce a fast reverse playback stream.

9. (Original) The method according to claim 8, further comprising retrieving the inter-coded and intra-coded frames from the first file in the order of the forward indices to produce a normal playback stream, and wherein the retrieving of inter-coded and intra-coded frames from the first file starts at a frame near a current playback point in the fast reverse playback stream, and wherein the frame near the current playback point is determined from the reverse indices.

10. (Original) A method of storing digital video content to facilitate trick play, the content comprising intra-coded frames of video and inter-coded frames of video, the method comprising:

- storing the inter-coded and the intra-coded frames of the content in a first file;

- storing the intra-coded frames of the content in a second file;

- storing a set of indices that relate the intra-coded frames in the first file with the intra-coded frames in the second file, such that playback of the second file simulates a fast-forward playback if played back in a first order and simulates a fast rewind if played back in a second order.

11. (Original) The method according to claim 10, further comprising generating the set of indices for storage.

12. (Previously Presented) The method according to claim 10, wherein the digital video content is MPEG encoded, wherein the intra-coded frames comprise I-frames, and wherein the inter-coded frames comprise P-frames and B-frames.

13. (Original) The method according to claim 10, further comprising retrieving the inter-coded and the intra-coded frames from the first file to produce a normal playback stream.

14. (Previously Presented) The method according to claim 13, further comprising retrieving the intra-coded frames from the second file in a first order of the indices to produce a fast forward playback stream, and wherein the retrieving of intra-coded frames from the second file starts at a frame near a current playback point in the normal playback stream, and wherein the frame near the current playback point is determined from the indices.

15. (Previously Presented) The method according to claim 10, further comprising retrieving the intra-coded frames from the second file in a first order of the indices to produce a fast forward playback stream.

16. (Original) The method according to claim 15, further comprising retrieving the inter-coded and intra-coded frames from the first file to produce a normal playback stream, and wherein the retrieving of inter-coded and intra-coded frames from the first file starts at a frame near a current playback point in the fast forward playback stream, and wherein the frame near the current playback point is determined from the indices.

17. (Previously Presented) The method according to claim 10, further comprising retrieving the intra-coded frames from the second file in a second order of the indices to produce a fast reverse playback stream.

18. (Original) The method according to claim 17, further comprising retrieving the inter-coded and intra-coded frames from the first file to produce a normal playback stream, and wherein the retrieving of inter-coded and intra-coded frames from the first file starts at a frame near a current playback point in the fast reverse playback stream, and wherein the frame near the current playback point is determined from the indices.

19. (Previously Presented) A method of storing digital video content to facilitate trick play, the content comprising intra-coded frames of video and inter-coded frames of video, the method comprising:

at a video on demand system for a television service provider:

storing the inter-coded frames of the content in a first file;

storing the intra-coded frames of the content in a second file;

storing a set of forward indices that relate the intra-coded frames to the inter-coded frames in a forward direction such that playback of the second file in the order of the forward indices simulates a fast-forward playback;

storing a set of reverse indices that relate the intra-coded frames to the inter-coded frames in a reverse direction such that playback of the second file in the order of the reverse indices simulates a fast-reverse playback, and

where, commands received at the television service provider from a subscriber terminal requesting trick play modes are implemented by retrieving inter-coded frames from the first file using either the forward or the reverse indices.

20. (Original) The method according to claim 19, further comprising generating the set of forward indices and the set of reverse indices for storage.

21. (Previously Presented) The method according to claim 19, wherein the digital video content is MPEG encoded, wherein the intra-coded frames comprise I-frames, and wherein the inter-coded frames comprise P-frames and B-frames.

22. (Original) The method according to claim 19, further comprising retrieving the inter-coded frames from the first file and the intra-coded frames from the second file to produce a normal playback stream.

23. (Previously Presented) The method according to claim 22, further comprising retrieving the intra-coded frames from the second file in the order of the forward indices to produce a fast forward playback stream, and wherein the retrieving of intra-coded frames from the second file starts at a frame near a current playback point in the normal playback stream, and wherein the frame near the current playback point is determined from the forward indices.

24. (Previously Presented) The method according to claim 19, further comprising retrieving the intra-coded frames from the second file in the order of the forward indices to produce a fast forward playback stream.

25. (Previously Presented) The method according to claim 24, further comprising retrieving the intra-coded frames from the second file and the inter-coded frames from the first file in the order of the forward indices to produce a normal playback stream, and wherein the retrieving of the inter-coded frames from the first file starts at a frame near a current playback point in the fast forward playback stream, and wherein the frame near the current playback point is determined from the forward indices.

26. (Previously Presented) The method according to claim 19, further comprising retrieving the intra-coded frames from the second file in the order of the reverse indices to produce a fast reverse playback stream.

27. (Previously Presented) The method according to claim 26, further comprising retrieving the intra-coded frames from the second file and the inter-coded frames from the first file in the order of the forward indices to produce a normal playback stream, and wherein the retrieving of

intra-coded frames from the second file and the inter-coded frames from the first file starts at a frame near a current playback point in the fast reverse playback stream, and wherein the frame near the current playback point is determined from the reverse indices.

28.-43. (Cancelled Without Prejudice)

44. (Previously Presented) A computer readable storage device for storage and retrieval of digital video content, comprising:

- at least one computer readable storage medium for use in conjunction with a video on demand system for a television service provider;

- a first file residing on the storage medium storing inter-coded frames of the digital video content;

- a second file residing on the storage medium storing intra-coded frames of the digital video content in a second file;

- a forward index table residing on the storage medium that relates the intra-coded frames to the inter-coded frames in a forward direction such that playback of the second file in the order of the forward indices simulates a fast-forward playback;

- a reverse index table residing on the storage medium that relates the intra-coded frames to the inter-coded frames in a reverse direction such that playback of the second file in the order of the reverse indices simulates a fast-reverse playback, and

where, commands received at the television service provider from a subscriber terminal requesting trick play modes are implemented by retrieving inter-coded frames from the first file using either the forward or the reverse indices.

EVIDENCE APPENDIX

Not Applicable

RELATED PROCEEDINGS APPENDIX

Not Applicable